## REMARKS

Claims 1-28 are currently pending in this application.

Claims 19-28 have been withdrawn, due to a restriction requirement.

Claims 1-18 have been rejected on various grounds. The Applicants respectfully traverse these rejections as they apply to the amended claims and request reconsideration.

Amendments to claims 1, 3 and 14 are requested.

**Interview summary:**

The Applicants thank the Examiner for holding a telephone interview with attorney Albert Metrailer on January 4, 2006. In the interview, the rejection of claims 1-18 and the Barker reference were discussed. In addition, the Examiner's position that if a vessel is sealed against a fluid then it is inherently sealed against pressure as stated in paragraph 18 of the office action of 11/17/2005, was also discussed.

The attorney noted that the Examiner's position is true if the vessel is a rigid structure capable of withstanding the pressure. For example, a rubber balloon can be considered to be a fluid tight vessel, but it does not seal against pressure. That is, pressure applied to the outside of a balloon is transferred to the material inside the balloon, but the material may be protected from fluids outside the balloon. This is relevant to the present invention because it provides a first chamber for the detonator that has upper and lower seals that protect against both pressure and fluids and provides a second chamber for the booster charge that has a lower seal formed by a rubber boot that protects against fluids, but allows external pressure to be applied to the booster charge and the detonating cord attached to the booster charge. Barker, in contrast does not provide a pressure and fluid seal at the lower end of the detonator chamber. Instead, Barker provides a

rubber boot that is intended to protect the booster charge from fluids, and if it properly performs this function, should prevent fluids from flowing into the detonator chamber and may thereby prevent fluids and pressure from affecting the detonator. However, if fluid leaks past the rubber boot, Barker does not provide a separate fluid and pressure seal that would prevent the fluid from flowing into the detonator chamber and increasing the pressure as it fills the detonator chamber.

The Examiner indicated that he understood the attorney's position, but no agreement was reached as to allowability of the claims, or whether any amendments should be made. The attorney indicated that he would provide a response stating the Applicant's position and the Examiner indicated that he would consider it further upon receiving the response.

**Claim Rejections – 35 USC § 102**

Claims 1-4 have been rejected under 35 USC § 102(b) as being anticipated by US Patent 4,998,477 issued to Barker.

A slight amendment to claim 1 is requested. As discussed in the interview summary, the present invention provides a positive pressure and fluid seal at the bottom of the detonator chamber, i.e. between the detonator chamber and the booster charge chamber. The Barker reference does not provide such a seal. The amendment is intended to more clearly identify the lower seal of the detonator chamber. It is formed by the combination of a bulkhead and an upper sealing surface of the booster charge holder that engages the lower sealing surface of the detonator chamber. In the embodiment of Fig. 1, this seal is formed at the O-rings 32 in combination with bulkhead 38. In the Barker reference, there is no positive sealing surface between the booster charge holder 17 and the detonator housing 14 which are joined by a threaded connection that is not identified by a reference number. If fluid manages to leak under Barker's boot 18, it can reach

not only the booster charge 27, but will flow into the detonator 15 chamber and increase pressure on the detonator as it fills the chamber. Such leakage events, and resulting failure of the detonator, are well known to the present inventors who are employed by the same company as was Mr. Barker and have knowledge of actual field experience with the devices made according to the Barker patent. The present invention was made, in part, to prevent detonator failure in the event of leakage of fluid past a rubber boot.

Claim 1 includes the structures that provide the positive fluid and pressure seal at the bottom of the detonator chamber. Since Barker does not teach or suggest such a seal, the Applicants submit that claim 1 is patentable over the Barker reference. Since claims 2-18 depend from claim 1, the applicants submit that claims 2-18 are also patentable over the Barker reference.

A slight amendment to claim 3 is requested to more clearly describe the physical relationship between the booster charge holder, the rubber boot and the booster charge. As originally written, claim 3 made it clear that the boot outer surface forms a sealing relationship with an inner surface of the booster charge holder. This arrangement is clearly different from the Barker reference in which the outer surface of the rubber boot does not form a seal with any other surface or element. The requested amendment would make it clear that the inner surface of the boot forms a fluid seal with an outer surface of the booster charge itself, not just the booster charge. In Barker, the boot inner surface forms a fluid seal with the outer surface of the booster charge holder and the detonator holder, not with the booster charge itself. This structural relationship has several advantages not achievable with the Barker arrangement. The rubber boot of the present invention is protected from surrounding fluids by the booster charge holder itself. Since the boot is between two other elements, it can be sized to fit tightly between those two elements and therefore be in compression. The compression fit improves the seal. In Barker, the

boot is stretched somewhat to fit over the booster charge holder and is held in contact only by its own elastic response to being stretched. But the entire outer surface of Barker's boot is exposed to borehole conditions that can degrade the elasticity of the boot which can cause leakage under the boot, as proven by actual field experience.

The boot 44 of claim 3 is similar to, but a substantial improvement over, the boot 18 of Barker. It also demonstrates that the fluid and pressure seal provided in claim 1 at the bottom of the detonator chamber is different from, and in addition to, the fluid seal provided by the boot 44. The embodiments of the present invention provide three sealing points, not two as taught by Barker.

Minor amendments to claims 3 and 14 are also requested to correct obvious typographical errors.

**Summary**

In view of the above remarks, the Applicants submit that the claims 1-18, as amended, are now allowable and respectfully request allowance of claims 1-18.

The Commissioner is hereby authorized to charge payment of any further fees associated with any of the foregoing papers submitted herewith, or to credit any overpayment thereof, to Deposit Account No. 50-1515, Conley Rose, P.C.

If the Examiner has any questions or comments or otherwise feels it would be helpful in expediting the application, he is encouraged to telephone the undersigned at (972) 731-2288.

Respectfully submitted,
CONLEY ROSE, P.C.

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